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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,516	04/13/2006	Peter Berenbrink	2003P12192WOUS	3915

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SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
170 WOOD AVENUE SOUTH
ISELIN, NJ 08830

EXAMINER	
KIM, TAE JUN	

ART UNIT	PAPER NUMBER
3746	

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04/14/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,516	BERENBRINK ET AL.	
	Examiner	Art Unit	
	Ted Kim	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-17* is/are rejected.

7)☒ Claim(s) *18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 8, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Braun et al (2001/0023578) in view of EP 1331448 and optionally in view of Iizuka et al (4,766,721). Braun et al teach a method for compensating variations in a fuel composition in a gas turbine system having a plurality of burner stages 5, 1 operated in parallel, comprising: adjusting a fuel supply to the burner stages 5, 1 in response to the variations in the fuel composition; splitting the fuel supply via valves 19a, 19b between the burner stages; wherein the gas turbine system comprises a pilot burner 11 stage and a main burner stage 5 and the fuel supply split between the pilot burner stage and the main burner; wherein a plurality of fuel control valves 19a, 19b are provided to the burner stages, wherein a regulator 27 is allocated to the fuel control valves. Braun et al do not teach the fuel supply split between the burner stages at a constant target value during the adjustment of the fuel supply. EP '448 teaches maintaining the desired fuel flow split (page 5, paragraph 1, see Fig. 3) between the primary and secondary burner stages in the combustor of a gas turbine. EP '448 teaches using this type of fuel trimming allows for

lower NOx emissions as it limits the maximum fluctuation of fuel flow and (see e.g. 2, lines 29-36) and a constant fuel/air ratio for the combustion process (page 4, lines 47-52). It would have been obvious to one of ordinary skill in the art to employ a constant split between the burner stages, as taught by EP '448 et al, in order to provide a constant fuel/air ratio in each combustor stage and/or or to limit the fluctuations of the fuel flow. Note that as the same fuel source 33, 37, BH is used for both burner stages in Braun et al and any fluctuation in the fuel composition will directly affect the fuel calorific value. Hence, for at least small changes in the fuel composition/calorific value, the split between the burners should remain at a constant split, since each burner would be equally affected by the change in the fuel calorific value, and stability is promoted by a maintaining a constant fuel/air ratio for each stage, as set forth in EP '448. It would have been obvious to one of ordinary skill in the art to maintain the split of fuel constant in response to variations during the adjustment of the fuel supply, as a conventional technique in splitting the fuel and in keeping with the desire to keep the fuel/air ratio in each burner constant. The above prior art inherently are pilot and main burners, as would be known in the art. In order to obviate any doubt, Iizuka et al teach the central diffusion stage is the pilot stage and radially outer stages are premixed main stages (see col. 1, lines 10+ and col. 9, lines 8-22 and col. 4, lines 7+). It would have been obvious to one of ordinary skill in the art to make the central burner the pilot stage the outer stages the main premixed stages, as taught by Iizuka et al, as the conventional practice for these configurations of burners.

3. Claims 8, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata et al (5,327,718) in view of Beebe et al (5,319,931). Iwata et al teach a method for compensating variations in a fuel composition in a gas turbine system having a plurality of burner stages (from fuel nozzles 9 and 19) operated in parallel, comprising: adjusting a fuel supply F to the burner stages in response to the variations in the fuel composition 30; splitting the fuel supply between the burner stages via e.g. valve 8a, 8b; wherein the gas turbine system comprises a pilot burner 9 stage and a main burner stage 19 (see col. 8, lines 18-27, which teach the pilot diffusion burner 9 is mainly effected at startup, while the main premixing burner stage 19 is mainly effected above a certain load, and thus the pilot burner stage is low during the main load operation). Beebe et al teach (col. 5, lines 29-37) that it is old and well known in the gas turbine art to maintain the split between the primary and secondary burner stages in the combustor. Beebe et al teach using this type of fuel trimming allows for lower NOx emissions as it limits the maximum fluctuation of fuel flow (see e.g. col. 6, lines 13-23) and a constant fuel/air ratio for the combustion process (col. 5, lines 9-13). It would have been obvious to one of ordinary skill in the art to employ a constant split between the burner stages, as taught by Beebe et al, in order to provide a constant fuel/air ratio in each combustor stage or to limit the fluctuations of the fuel flow. Note that as the same fuel source FP is used for both burner stages in Braun et al and any fluctuation in the fuel composition will directly affect the fuel calorific value. Hence, for at least small changes in the fuel composition/calorific value, the split between the burners should remain at a constant split, since each burner

would be equally affected by the change in the fuel calorific value, and stability is promoted by a maintaining a constant fuel/air ratio for each stage, as set forth in Beebe et al.

4. Claims 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata et al (5,327,718) in view of Beebe et al (5,319,931) as applied above, and further in view of Vandervort (6,082,092). The above prior art teach an analyzer calculating the calorific value of the fuel (see Iwata et al 29), an updating unit 30 or 32 adjusting the regulator 29 and control valves 8a, 8b based on the calorific value. The above prior art do not teach using a current Wobbe analysis and using the Wobbe index in the updater unit. Vandervort teaches that the Wobbe number uses the calorific value divided by the square root of the absolute temperature * the specific gravity, see the equation on col. 2. Thus the Wobbe Number is directly proportional to the calorific value and is a better index of determining compatibility of gas turbine fuel systems with different fuels than the calorific value alone (see e.g. col. 1, lines 62+). Vandervort further teaches using a measured Wobbe number with a desired Wobbe number allows reduction of combustor dynamics and damage. The calculated Wobbe number 40 is compared to an expected Wobbe number 44 and the results used in an updating unit 42. It would have been obvious to one of ordinary skill in the art to employ the current Wobbe analysis and using the Wobbe index in the updater unit, as taught by Vandervort, to better determining compatibility of gas turbine fuel systems with different fuels than the calorific value alone and/or to reduce combustor dynamics and damage. As for the computing unit,

regulator, and updating unit being separate or integrated, these options are both well within the ordinary skill in the control art. These were illustrated as separate control blocks and making them integral or separate is an obvious matter of using the conventional ways of implementing them, for either a modular approach or an integrated approach with fewer units.

Allowable Subject Matter

5. Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments filed 01/16/2008 have been fully considered and are persuasive with regard to the Urishidani et al reference but they are not persuasive with respect to the Braun and EP '448.

7. Applicant's argues that EP '448 teaches "maintaining a desired fuel flow split without regard to whether the split is kept at a constant value or varied over time." In rebuttal, EP '448 teaches "*maintaining* a desired fuel flow split." The desired fuel flow split is maintained, implicitly requires keeping a constant fuel flow split. Furthermore, there is nothing in the claims to indicate how long the split is maintained at a constant value, hence, applicant is arguing a period of time which is simply not in the claims.

8. Applicant's argues that proposed combination of references is a piecemeal combination based on hindsight. In response to applicant's argument that the examiner's

conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). EP '448 teaches maintaining the desired fuel flow split (page 5, paragraph 1, see Fig. 3) between the primary and secondary burner stages in the combustor of a gas turbine. EP '448 teaches using this type of fuel trimming allows for lower NOx emissions as it limits the maximum fluctuation of fuel flow and (see e.g. 2, lines 29-36) and a constant fuel/air ratio for the combustion process (page 4, lines 47-52). It would have been obvious to one of ordinary skill in the art to employ a constant split between the burner stages, as taught by EP '448, in order to provide a constant fuel/air ratio in each combustor stage and/or or to limit the fluctuations of the fuel flow. Note that as the same fuel source 33, 37, BH is used for both burner stages in Braun et al and any fluctuation in the fuel composition will directly affect the fuel calorific value. Hence, for at least small changes in the fuel composition/calorific value, the split between the burners should remain at a constant split, since each burner would be equally affected by the change in the fuel calorific value, and stability is promoted by a maintaining a constant fuel/air ratio for each stage, as set forth in EP '448. It would have been obvious to one of ordinary skill in the art to maintain the split of fuel constant in response to

variations during the adjustment of the fuel supply, as a conventional technique in splitting the fuel and in keeping with the desire to keep the fuel/air ratio in each burner constant.

9. Due to the application of new art above, specifically the Iwata et al combination, this action is made non-Final.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax number for the organization where this application is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer, can be reached at 571-272-7118. Alternate inquiries to Technology Center 3700 can be made via 571-272-3700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at http://www.uspto.gov/main/patents.htm

/Ted Kim/	Telephone	571-272-4829
Primary Examiner	Fax (Regular)	571-273-8300
April 14, 2008	Fax (After Final)	571-273-8300
Technology Center 3700	Telephone	571-272-3700